

Application of Industrial Psychology
to the Blind



**M.C. MIGEL LIBRARY
AMERICAN PRINTING
HOUSE FOR THE BLIND**

6. Study of general and local occupations, vocational opportunities and problems of the occupational world should be carried on in organized classes, taught by vocational counselors or specially trained teachers. Occupational pamphlets should be prepared giving information to young people regarding the duties, conditions of work, and preparation necessary for the occupations they may eventually enter.

7. Opportunities for all forms of training, vocational and academic, and educational experience, such as try-out courses, should be provided in increasing numbers. Any form of vocational education should be flexible and should take into account the rapid changes in production and be adapted to the varying needs of individual boys and girls.

8. More adequate facilities should be provided for separate junior placement offices under the public schools or other public agencies, where the interests and welfare of the children stand before all other considerations.

Application of Industrial Psychology to the Blind

THE National (British) Institute of Industrial Psychology is studying the problem of helping the blind to become effective members of the community.¹ The first step in the investigation was to ascertain in what occupations, other than those found in the existing workshops for the blind, these handicapped persons could most usefully be employed. The principal training institutions and workshops for the blind in and near London were visited and the occupations being carried on were studied in some detail. Later on, several workshops in the Provinces were surveyed. In general, these shops were primarily producing machine-knitted goods, mats, baskets, brushes, and other articles that the blind have been making for so many years. Results of experiments with blind workers in other countries were also carefully examined. The available data, however, for the most part were not definite on such important matters as earnings, efficiency, etc. Factories employing workers who were not blind were then visited with a view to studying occupations which might be filled satisfactorily by sightless persons. A list was made of such occupations.

The blind in telephone manufacture.—A definite offer of work for the blind for a brief period, on a subcontracting basis, was received from the manager of a factory manufacturing telephones. An experiment was made for nearly three months in employing such workers on a repetitive process, which consisted in fastening together a number of wires in a "form," so that when the form is inserted in a certain part of the telephone, connections can immediately be made. The wires, which are of different lengths and colors, must be passed through holes in a special way and are then wound together with waxed thread.

As already shown by psychological analysis, skill in the execution of movement depends not only upon muscular control but upon visual control. In writing, for instance, the movements are almost automatic but the alignment is controlled by vision which prevents the degeneration of the letter forms. Handwriting grows worse as a result of blindness even when raised lines are used. Consequently, it would seem that blind persons can acquire real skill only in work

¹ The Journal of the National Institute of Industrial Psychology (London), April, 1931, pp. 334-343: "Industrial Psychology Applied to the Blind," by C. B. Fox.

which is "truly independent of vision in the sense that effective substitutes for visual control can be developed."

The experiment on "forming" in the telephone factory fully confirmed this conclusion. The most proficient workers were found to be those who still had enough vision to distinguish colors and forms. How much they used their eyes could not be determined, but their superior output could hardly have been due to chance. It was quite obvious that a totally blind person took more time to do the same work than one who had some little sight, as the former had to grope more for his material. Although groping may be considerably reduced by special layouts and apparatus, it can not be eliminated altogether and therefore the productivity of the blind is adversely affected.

Manual dexterity tests for the blind.—Four tests were devised in order to estimate manual dexterity: (1) The placing of pegs in holes in a board; (2) a similar placing of pegs, the thumb and fingers of the preferred hand being used independently in turn; (3) the threading of nuts on small bolts (both hands); and (4) screw twisting in which movements of the wrist are dominant.

The results of these tests, which were given in private to the blind workers individually under the same experimental conditions, are as follows:

(a) *Influence of age.*—In straightforward pegging and in the assembly of nuts and bolts there was a progressive reduction in speed from the age of about 20. In the screw-twisting test, however, with the exception of the older totally blind, there were no marked differences in score between one age group and another.

(b) *Influence of vision.*—The difference between the partially and the totally blind was similarly very marked in the peg-board and nuts and bolts tests, but not in the screw-twisting test.

(c) *Influence of trade (for both partially and totally blind).*—In two of the tests the boot-repairing group showed a marked superiority to the other trade groups, while the poor performance of the mat and brush makers in all the tests was outstanding.

Wage study.—In nearly all cases, records of wages for two years or more were available. This made it possible to compare the average weekly earnings for the quarter reviewed with the earnings in the corresponding quarter a year or two years preceding. No attempt was made to compare wages in different workshops, as conditions and methods of payment were so varied. Within each workshop, however, the investigators found it possible to compare the earning capacity of different classes of blind persons.

In order to make comparisons the blind men were divided into two classes, the totally blind and the partially blind; the former class includes those who can only see enough to distinguish light and dark (with or without the ability to name the primary colors) and who can not recognize objects with certainty even when they are large. The partially blind class is made up of the remaining blind persons whose vision is less than 6/60 of normal.

The findings based on the wage data are:

The figures suggest that in almost all the workshops the maximum earning capacity tends to fall for the larger groups, within the years 30 to 40. This seems to hold for men and women, and for partially and totally blind alike, but the effect may be obscured by differences in experience within each age group. Since the age at which the person becomes blind varies greatly, the average experience of the age groups given does not always increase proportionately. On the whole, the variations in earnings are small.

A rearrangement of the data according to length of experience does not help greatly, since there are too few cases to allow of subdivision into groups equal in both age and experience. There is, however, a general tendency for earning capacity to increase during a period of 10 or 11 years and thereafter to decrease.

Much larger differences are seen, however, when the earnings of the partially blind and the totally blind are compared. The relative efficiency of these groups as shown by the wage records is substantially in favor of the partially blind. Although the effects of age and experience are not wholly excluded, the general trend of the differences in earnings is unmistakable. A composite figure for the average earnings of the partially blind, as compared with those of the totally blind, would be misleading unless the average experience of each group were substantially the same and the numbers approximately equal.

Blind workers' isolation.—The blind are unconscious of many happenings around them and of what other workers are doing unless their neighbors inform them. This relative isolation of sightless persons is an outstanding peculiarity and causes delays resulting from loss of rhythm or slowing down of the work rate.

The limited environment and lack of external stimuli tend to make many of the blind very self-centered and to fix their attention on their own difficulties. This brooding is frequently the cause of the many perplexities which arise in dealing with sightless people. Solitary rumination has a tendency to reduce the vitality of these handicapped workers and after a time lessens their output.

Most encouraging results in breaking down the isolation of sightless workers were obtained in the institute's experiment in teamwork in the basket department of a blind institution. Each member of the team was considerably interested not only in the carrying on of the experiment as a whole but also in each man's work.

After the first two days the team were left from time to time to carry on without supervision. Each man soon took a share in the extra work involved in keeping the materials and baskets in circulation, but the efficiency of the team was hardly impaired thereby. There seems to be little doubt that part of the success of this experiment was due to the overcoming of the isolated introspective state of the blind. If more ways of overcoming this relative isolation could be introduced into the methods of blind workshops, a greater cooperation and a more healthy spirit would prevail not only amongst the blind themselves, but also in their relations with their sighted colleagues.

Subdivision of work.—It is the custom in the basket departments of workshops for the blind for each worker to make a complete basket. The institute, however, undertook an experiment in which four volunteers manufactured the basket, one making the bottom, another doing the staking and "upsetting," another the siding, and a fourth the border and the foot. The institute's investigator prepared the material for the baskets and passed the completed parts from one volunteer to another, as the basket makers were not working side by side.

After due allowance was made for preparing the material and for any aid in finishing, the output under the new scheme was found to be 25.2 per cent in excess of that under the old plan, with a considerably more regular flow of production.

Teamwork versus craftsmanship.—The suggestion has been made that teamwork may have a tendency to lessen the sense of craftsmanship among blind basket makers. Each trainee, however, must learn the methods for making finished samples of each kind of basket before he is regarded as proficient. As a rule, workshops have found it both convenient and profitable to have a man specialize on several

kinds of baskets. The number of orders in which the above-described system of subdivision of work could be successfully operated would not be large enough seriously to impair the sense of craftsmanship or to interfere substantially with the worker's ability to make several kinds of baskets satisfactorily.

Teamwork of blind girls.—The efficiency of blind girls compared with average factory workers employed by Cadbury Bros. (Ltd.) was reported upon by Miss Cadbury, who stated that the output of a team made up of two workers with normal sight and five blind girls is 84 per cent of teams in which all the members have normal sight. The increase in cost is about 2 per cent (girls' wages only). When the team has three members with normal sight and four blind girls the production is ordinarily 91 per cent of teams with normal sight. The cost of the mixed team in this case is about 1 per cent more (girls' wages only). "The blind girls earn the same amount as the sighted teams," Miss Cadbury reports. "This is due to the fact that they work only on the lighter and better-paid packings. They also receive more assistance from the men."

Cadbury Bros. also pay slightly more to the girls with normal sight on the mixed teams, as they are obliged to do more to maintain the team's output. In other words, the responsibility for the maintenance of the team's efficiency is on the shoulders of the members who have sight. In observing the team at work the institute's investigators saw plainly that the regular flow of packed cartons was dependent largely upon the watchfulness of the two workers with sight who led the team. An additional prepared carton placed at the proper time, a set of labeled tins removed when necessary or one more package tied up later on, of course, made a big difference not only in regulating the run of the work but in eliminating any consciousness of strain which might result from the blind employee's realization that she was not up to the mark.

This type of aid being essential when the girls are able to see a little, the amount of assistance required when the workers are totally blind may be readily imagined. In fact, the work being done by the blind at Cadbury Bros. is simple and seemingly well within the capacity of persons who are totally blind. Speed of movement, however, is the vital issue, and there is reason to doubt whether the average totally blind person could ever work with the quickness required.

Proportion of blind workers to supervisor with sight.—The number of the supervisory staff with sight as compared with the number of blind workers supervised varies greatly in different institutions. Substantial variations were also found in the earnings of different blind workers. In order to ascertain whether these two types of variations were definitely correlated with each other the institute sent a questionnaire to each of the blind institutions in England. At the time the article under review was being prepared the replies to the inquiry were being examined to determine the effects of supervision upon blind workers after they have become experts in their trade.

Layout of raw material.—Unless particular attention is given to layout, blind workers inevitably waste time groping for implements or materials. The institute has designed a rack for one basket-making department which holds the cane from which the baskets

are made. This arrangement so facilitated the finding and withdrawal of the material that the output increased 10 per cent.

After a detailed study of the layout and operation of a knitting factory, methods were devised by the institute to cut down waste in time and material. A planning system was inaugurated to enable the establishment to supply goods on the dates promised, and a rearrangement was made which extended the available storage accommodation. By decreasing waste, etc., savings of more than £1,000 (\$4,867) a year were effected. Furthermore, there was an increase in turnover of £1,350 (\$6,570) per annum.

Future study.—The institute's work for the blind can be greatly enlarged and intensified by—

1. The vocational selection of the blind for training for specific industries;
2. Research into the methods adopted for training blind pupils in various industries;
3. Detailed studies of the trades followed by the blind to eliminate waste of time, labor, and material, etc.; and
4. Training the blind and organizing their employment in factories with the assistance of sighted labor so that they shall attain their maximum efficiency. For this purpose methods must be introduced to secure the cooperation of the employers and the management in these "sighted" factories.

The more highly educated blind present a rather different group of problems. Professions and careers must be found for these people, and a study should be made of the educational limitations resulting from their blindness. The best vocational education methods in view of such limitations are yet to be ascertained. Moreover, placement methods after vocational education should also be made the subject of investigation.

COOPERATION

Cooperative Provision of Medical and Health Service¹

IN VIEW of the high cost of illness in this country it would seem that the provision of medical care offers a real opportunity for cooperative effort. As yet, however, cooperators in the United States seem to have taken very little advantage of this opportunity, though there are a few scattered instances in which medical or preventive work is done.

The Franklin Cooperative Creamery Association of Minneapolis, Minn., during 1925 and 1926 operated a clinic for the children of its members, but this was later discontinued.

The Cooperative Temperance Café, Chicago, Ill., pays sick benefits of \$1 a day to any employee who is sick for more than a week.

Sick-benefit societies do, of course, partake of the cooperative character, but can not be said to be part of the cooperative movement. Perhaps the organization of this type which is most nearly cooperative in character is the Workmen's Circle, which carries on many social activities on a cooperative basis. Among these are sick benefits, operation of a tuberculosis sanitarium, and death benefits.

The New York City branch of the organization pays sick benefits of \$6 a week for a maximum of 15 weeks per year. Data supplied to the Bureau of Labor Statistics by the organization show that the sick benefit department has a membership of 57,691 persons, of whom 9,745 received benefits during the year 1930, in the amount of \$357,833—or an average of about six weeks' benefits per member. For these benefits each member pays a fee of \$5.80 per year; the amount collected in fees in 1930 was \$334,518.

There are 17,382 persons enrolled in membership with the medical section, each of whom pays \$4.80 per year, which entitles both himself and family to service at the doctor's office and at his own home. The medical section also makes arrangements for consultations and for operations by specialists at nominal fees. There is no restriction as to the amount of care which shall be rendered to any one family during the course of a year. There are 43 physicians in the New York district who work for the circle on a part-time basis, besides 24 specialists. The circle also operates its own health center, in the nature of a clinic, at which nominal fees are charged.

¹ The data on which this article is based are from U. S. Department of Agriculture, *Agricultural Cooperation*, Nov. 13, 1929; U. S. Bureau of Foreign and Domestic Commerce, Special report No. 13, 1919 (unpublished) and Bul. No. 101; Consular reports of Sept. 20, 1927 (Switzerland), and Sept. 8, 1928 (Norway); *Cooperation* (New York), issues of May and August, 1921, February, 1922, January, 1924, February, March, and June, 1925, and March, 1930; International Labor Office, *Cooperative Information*, Nos. 50, 60, 91, 93, 108, 115, and 117; *Review of International Cooperation* (London), issues of May, 1929, August, 1929; *International Cooperative Bulletin*, July, 1923; *Cooperation at Home and Abroad*, by C. R. Fay; *Cooperative Democracy*, by J. P. Warbasse; *The Labor Movement in Post-War France*, by David J. Saposs; *La Coopération Belge*, Oct. 15, 1929; *People's Yearbook*, 1931; *Cooperative Productive Review* (Leicester, England), May, 1930; *The Producer* (Manchester, England), May, 1931; *Information Bulletin of Centrosyoyus* (Moscow), April, 1929; *Verband Schweizerischer Konsumvereine* (V. S. K.), *Rapports et comptes sur l'activité des organes de l'union en 1929*; *La Coopération* (suisse), Nov. 14, 1929, and May 28, 1931; and data supplied to the U. S. Bureau of Labor Statistics by individual societies and organizations.

**Photomount
Pamphlet
Binder**

Gaylord Bros.Inc.

**Makers
Syracuse, N. Y.**

PAT. JAN 21, 1908

